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(54) Title of the Invention: ADHESIVE TAPE ROLL, ITS PRODUCTION AND ROLL CORE TO BE USED THEREIN

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(54) (Title of the Invention): Adhesive Tape Roll, Its Production and Roll Core To Be Used Therein

(57) Summary

(Purpose)

To provide an adhesive tape roll enabling to reduce deformation with a relaxation of the shrinkage stress.

(Construction)

An exothermic film 12, having the form of a thin film, and a thick film layer 13 are deployed on a winding core 1 of a roll core unit. This is followed by winding of adhesive tape 2 and generation of heat, which is applied to the thin film exothermic layer 12 so as to induce melting or shrinking of the thick film layer 13.

[see figure]

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(Scope of the Patent's Claims)

(Claim 1)

A method to manufacture adhesive tape, characterized by the fact that an adhesive tape is wound on a roll core, wherein a thin film exothermic layer and a thick film layer are created on a core, said thin film exothermic layer is heated and the thick film layer is melted or shrunk.

(Claim 2)

An adhesive roll tape manufactured according to claim 1.

(Claim 3)

A roll core used with the method described in claim 1, wherein a thin film exothermic layer and a thick film layer are deployed on a roll core.

(0001)

(Field of Industrial Application)

This invention relates to a method to manufacture an adhesive tape roll, an adhesive tape manufactured with this method, and a core that is used with this method.

(0002)

(Prior Art Technology)

Although in the past, adhesive tapes which were created so that an adhesive layer was deployed on one surface of a carrier were generally used for packing and similar purposes, in order to prevent volute shaped or bowl shaped deformations from being created by the tension force generated when the tape is wound onto a paper core, a synthetic resin foam substance layer was created on the outer periphery of the paper core, or a gap was created in the paper core.

(0003)

(Problem to Be Solved By This Invention)

However, when a synthetic resin foam substance layer was deployed on the outer periphery of a paper core, or when manufacturing was conducted so that the tape was wound with a spiral shape while a gap was created between the tape and the base paper with a design wherein a spiral shaped gap was created in advance in the width direction of the base paper, so called sinking could easily be caused by fatigue and similar phenomena just after the adhesive tape was wound on the paper core. As a result of that, the problem was that cracks could be easily caused by irregularities in a blade during cutting with a specified width. In addition, with an other method, when an empty space was created in a paper core so that a non-adhesive layer was pulled out after an adhesive tape was wound up on one laminated layer of the base paper so that the bottom and top layers were not attached, once the tape was pulled out on the inner side from the non-adhesive layer of the paper core, a very complicated manual operation was required to insert the remaining part of the tape again in the original location.

(0004)

The purpose of this invention is to resolve the problems related to prior art mentioned above by providing a method for the manufacturing of an adhesive tape roll and a roll core with a method enabling to reduce deformation through a relaxation of the shrinkage stress.

(0005)

(Means to Solve Problems)

The gist of the present invention is as follows. The present invention uses a method for manufacturing of an adhesive tape roll, characterized by the fact that an adhesive tape is wound on a roll core on which an exothermic layer having the shape of a thin film and a thick film layer are created, wherein heat is generated in the thin film shaped exothermic layer to induce melting or shrinking of the thick film layer, when a thin film shaped exothermic layer and a thick film layer are created according to this method on the core of an adhesive tape roll manufactured with the roll core used in this manner.

(0006)

Although it is possible to use a metal according to prior art in order to form the thin film exothermic layer in this invention as long as it is a superheated material which is conductive to high frequencies, it is desirable to use a material that has excellent electric conductivity with a thin film thickness of the material, for example a copper foil with a thickness of about 20 μm.

(0007)

There are no particular limits with respect to the material to be used to form the thick film

layer in this invention and it is possible to use for example a synthetic layer foam substance characterized by a foam expansion factor in the range of 5 ~ 10, such as a low-density polyethylene foam or a similar substance with a thickness of 1 ~ 2 mm.

(0008)

There are no particular limitations with respect to the sequential order of the lamination layers which are used to form the thin film shaped exothermic layer and the thick film layer in this invention.

(0009)

(Operation)

According to the adhesive tape roll manufacturing method of this invention, when an adhesive tape is roll is wound on a roll core while a thin film shaped exothermic layer and a thick layer are created on the roll core so that heating is applied to a thin film exothermic layer, melting or shrinking of the thick film layer is induced. This makes it possible to manufacture an adhesive tape roll in which a gap can be created in the direction of the thickness of the thick film layer without a complicated manual operation, so that the shrinking stress is relaxed and deformations are prevented.

(0010)

The adhesive tape roll of this invention makes it possible to relax shrinking stress and to prevent deformation with a gap created in the thickness direction in the thick film layer. In addition, because the roll core of the present invention has a thin film exothermic layer and a thick film layer created on the core unit, after an adhesive tape has been wound on the outer periphery, a gap can be created in the thickness direction, inducing melting or shrinking of the thick film layer when heating is applied to the thick film exothermic layer.

(0011)

(Embodiment)

The following is a concrete explanation of an embodiment of this invention. This invention, however, is not limited to this embodiment.

(Embodiment)

As shown in Figure 2, a low density polyethylene foam substance, which has a foam expansion factor of 5 and a thickness of 1 mm and which is provided with a copper foil with a thickness of 20 μm, is used to create a laminated body so that is provided with a spiral shape between the outer side base paper, which is 1 mm thick and the inner side base paper, which is 3

mm thick. A roll core 1, comprising a tick film layer 13 made of synthetic resin foam and a thin film foam layer 12 made of a copper foil, is created in the intermediate space between a paper tube 11 on the inner side and a paper tube 14 on the outer side.

(0012)

On the outer periphery of the roll core 1 is created an adhesive tape 2 with a width of 0.95 μm and a length of 100 m, provided with an adhesive layer having a thickness of 20 μm on one face of a carrier, which is manufactured from polypropylene by biaxial drawing with a thickness of 40 μm. The adhesive tape roll obtained in this manner is inserted into a high frequency superheating apparatus which is 1 m long and which uses an inner coil diameter of 150 mm with 600 coil windings/m, and the apparatus is energized for 10 seconds with a high frequency at 10 kHz and electric current of 15 A so that heating is applied at approximately 120°C to the thin film exothermic layer 12.

(0013)

When heating is applied to the thin film exothermic layer 12, shrinking is induced to a thickness of approximately 0.5 mm and a gap is created in the thickness direction of the thick film layer 13, so that the thick film layer is deformed on the inner side of the outer side paper tube 14 (Figure 1). After 100 samples of the adhesive tape obtained in this manner were aged for a period of 30 days at 40°C, the number of dropped samples and the number of deformed samples with a scraped off width of more than 1 mm were counted visually.

(Comparative Example 1)

An adhesive tape was obtained in the same manner as in Embodiment 1, except for the fact that high frequency induced superheating was not conducted, and also the counting was conducted in the same manner.

(Comparative Example 2)

A low density polyethylene foam having a foam expansion factor of 15 was used for the thick film layer so that an adhesive tape was obtained in the same manner as in Embodiment 1, except for the fact that high frequency induced superheating was not carried out. The counting was again conducted in the same manner.

(0014)

Table 1 shows the percentages of deformed samples including dropped samples and samples that were scraped off with a width of more 1 mm in the above described Embodiment 1 and in Comparative Examples 1 and 2.

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(0015)

(Table 1)

	Embodiment	Comp. Example 1	Comp. Example 2
No. of Dropped Items (%)	15	0	100
No. of Deformed Items (%)	10	100	30

(0016)

As was explained above, because the relaxation characteristics were low in Comparative Example 1, deformation occurred easily although dropping did not occur. Dropping was generated, however, in Comparative Example 2 and there were also some occurrences of deformation. When an embodiment of this invention is compared to these comparative examples, while there were some occurrences of dropping, it was possible to greatly decrease occurrences of deformation in the embodiment of this invention.

(0017)

(Effect of the Invention)

The method to manufacture an adhesive roll of this invention and a roll core used with the method of this invention with an adhesive tape roll, manufactured and constructed with the above described method, make it possible to eliminate a complicated manual operation, while also making it possible to suppress occurrences of dropping which are due to shrinking stress. This makes it possible to greatly reduce deformation.

(Brief Explanation of Figures)

(Figure 1)

A profile view showing one example of an adhesive tape roll manufactured according to the method of this invention for manufacturing of adhesive tape rolls.

(Figure 2)

A profile view showing one example of the roll core of this invention.

(Explanation of Codes)

1 roll core

2 adhesive tape
11 paper tube
12 thin film shaped exothermic layer
13 thick film layer
14 paper tube

(Figure 1)

(Figure 2)